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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

Navy Contracting: Analyzing Critical Success Factors and Perceived Impact on Success within an Organization

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By: **Joshua R. Hill**
Kevin L. McGraw

September 2012

Advisors: **Janie Maddox**
Rene Rendon
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NAVY CONTRACTING: ANALYZING CRITICAL SUCCESS FACTORS AND PERCEIVED IMPACT ON SUCCESS WITHIN AN ORGANIZATION

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Submitted in partial fulfillment of the requirements for the degree of

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NAVY CONTRACTING: ANALYZING CRITICAL SUCCESS FACTORS AND PERCEIVED IMPACT ON SUCCESS WITHIN AN ORGANIZATION

ABSTRACT

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LIST OF ACRONYMS AND ABBREVIATIONS

CSF	Critical Success Factor
DAWIA	Defense Acquisition Workforce Improvement Act
DoD	Department of Defense
FY	Fiscal Year
GAO	Government Accountability Office
IG	Inspector General
IS	Information System
KSF	Key Success Factor
LPTA	Lowest Price Technically Acceptable
NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NAVSUP-GLS	Naval Supply Systems Command-Global Logistics Support
PEO	Program Executive Office
PM	Project Management

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From Josh Hill:

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I. INTRODUCTION

This chapter will introduce the research on Critical Success Factors (CSFs) in Navy Contract Management and show how identifying and incorporating these into Navy contracting could help improve the overall contracting process. Chapter I will include: a background, the purpose of the study, the problem statement, research questions, assumptions and limitations, methodology, the significance of the study, and the organization of the research. Finally, it will conclude with a brief summary of the discussion.

A. BACKGROUND

Identifying CSFs within an organization could potentially help meet critical mission objectives. Identifying those factors can be a vital asset and assist leadership in achieving successful outcomes in contract management. This research will focus on three major commands within the United States Navy: Naval Supply System Command, Global Logistics Support (NAVSUP-GLS), Naval Sea Systems Command (NAVSEA), and Naval Air Systems Command (NAVAIR) and two major Department of Defense (DoD) contractors. We will strive to analyze contract management CSFs, referencing information and feedback received from the respective organizations. In particular, the research will help identify any statistically significant correlation within these activities CSFs by using a detailed regression analysis. The report will conclude with findings of significance to Naval contracting activities based on correlations between CSFs and the perceived ability of the agencies employees to carry out their mission to meet them.

We begin this discussion by examining the definition of CSFs (as cited in Dryhaug, 2002). CSFs are areas of activity in which favorable results are necessary for a company to reach its goal (Rockart & Bullen, 1981). The term, *Critical Success Factor* is commonly used amongst practitioners and researchers alike. However, they do not necessarily share the same belief as to what CSFs are and how this method works. Businesses use CSFs as essential guidelines for the company or project to achieve its

mission. For example, as described in Table 1, shows list of potential CSFs for a company that develops information technology solutions is user/client involvement (Nasir & Sahibuddin, 2011).

Table 1. Commonly Agreed Upon CSFs for Information Technology Solutions

Majority Consensus
• Cost and time
• Meet initial project technical specifications
• Meet project objectives or project contributes to strategic, tactical and operational goals financially and technically
• Client/owner
Less Consensus
• Satisfaction of user, project team, contractor, parent organization
• Benchmarking with other projects
• Evaluation of quality of technical management process
• Separate product evaluation in terms of manufacturability, reliability, maintainability, etc.
• Personal growth
• Learning and motivation for future projects (Dryhaug, 2002)

D. Ronald Daniel first presented the idea of CSF in the 1960s (Daniel, 1961). Since then, a number of individuals have analyzed their effect on businesses. In the early 1980s, Christine V. Bullen and John F. Rockart popularized this idea with their article, "A Primer on Critical Success Factors." According to Rockart, CSFs refer to, "The limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization" (Rockart, 1979). There are a few key areas where things must go right for the business to flourish. According to Rockart, if the results in these areas are not optimal, the organization will most likely fall short on critical mission objectives.

DoD contracts account for approximately 70 percent of all federal procurement with acquisition workforce professionals responsible for managing over three million contract actions (FPDS-NG, 2011). In Fiscal Year 2010, the DoD spent over $367 billion in contract actions out of a total of $664 billion in DoD outlays. This is an increase of $156 billion in fiscal year 1990 in constant fiscal year (FY) 2010 dollars. The Navy received $88 billion of this funding with the remainder divided between the Army, Air Force, and other DoD components. This is an increase of 4.1 percent for contracting outlays versus a .2 percent increase over noncontract DoD outlays over the same period (FPDS-NG, 2011). The budget requests $280 billion for DoD contracts in 2013 (OMB, 2012).

The extent and amount of DoD spending necessitates that these contract management processes are well managed (Thai, 2004; Rendon 2010). That said, between 2001 and 2009, the Government Accountability Office (GAO) has issued 16 reports related to trends, challenges and deficiencies in federal government contracting. In addition, between 2002 and 2008, the DoD Inspector General (DoD IG) issued 142 reports on deficiencies in the DoD acquisition and contract administration processes. These reports have identified project management and contract management as some of the critically deficient areas in DoD contracts (Rendon, 2010). Because of these issues, the GAO has determined that DoD contracting is at risk, and subject to more scrutiny and oversight.

The overall effect of these findings has significantly affected the acquisition workforce. Over the last ten years, defense spending on contracts for weapons and other systems nearly tripled while the DoD acquisition workforce fell by more than ten percent. (OUSD, 2012)

After years of downsizing, there is now a concentrated effort from DoD in place to increase numbers and add critical skills within the acquisition workforce (OUSD, 2012). In response to this high-risk rating, the DoD is placing an emphasis in the areas of education, training and the development of workforce competence models (Newell, as cited in Rendon, 2009). In theory, the increase should have a positive effect on the

contract management process. Just as individual competence will lead to greater success in performing tasks, organizational process capability will ensure consistent and superior results for the enterprise (as cited in Rendon, 2010).

Many companies have benefited from the identification and exploitation of CSFs. The DoD has taken notice of this and spent vital resources identifying CSFs within Project Management (PM) for information technology across several federal agencies (GAO, 2011). However, very little research specific to contracting has been conducted thus far. Contract management and PM are integrally related. Both typically include planning, awarding, and administering contracts for the performance of the project-related effort. Effective contract administration is integral to successful project management (Rendon, 2010). The identification of CSFs in regards to contract management should lead to an intensive study of how they affect the contracting aspect of project management.

The focus of this research will further the academic study of CSFs in relation to contract management process within the specified Navy contracting activities and the defense industry. The analysis of individual surveys received from these organizations will be studied and categorized to identify specific factors that employees believe make their organization successful. The identification of commonalities and differences are highlighted. This identification and analysis will be the focus of this research.

B. PURPOSE OF STUDY

This research will examine the results of the surveys sent to various contracting commands by Rendon in 2009. The research plan is to analyze survey results received from three major Navy contracting organizations and two DoD contractors by conducting a statistical analysis to determine if any correlation exists between the organizations. The data was collected from the following three contracting agencies: Naval Air Systems Command (NAVAIR), Naval Supply Systems Command-Global Logistics Support (NAVSUP-GLS) and Naval Sea Systems Command (NAVSEA). The surveys attained from the two DoD contractors shall remain anonymous throughout the research, but will provide useful insight into the defense contracting industry. Each command was

specifically chosen in an effort to provide ample data results from three of the largest contracting activities in the U.S. Navy. The results from this research will benefit the Navy by identifying factors critical to an agency's success.

C. PROBLEM STATEMENT

The background information provided a brief introduction of CSFs and how the following research will further the academic study of CSFs in relation to contract management within the specified Navy contracting activities and the defense industry. From this information, the following problem statement is derived: What benefits can be taken away from conducting research to identify specific factors employees believe makes the organization's contracting process successful? The research will attempt to answer this question and provide those results in Chapter IV.

D. RESEARCH QUESTIONS

The following questions were developed to guide the research:

1. What Critical Success Factors, analyzed statistically from surveys received, can be identified from within each of the major Navy contracting activities?

2. From a contracting perspective, what are the significant comparisons between the Navy contracting agencies that can be can inferred from the statistical analysis?

3. Are there any significant CSF similarities between the military contracting activities and two DoD contractors' statistical results?

E. METHODOLOGY

The survey results from three Navy contracting activities and two DoD contractors will be statistically analyzed to identify any significant correlation and trends amongst the organizations. Results from the research conducted can be used to determine whether the utilization of CSFs in contracting activities will benefit the U.S. Navy, based on apparent correlations between CSFs' and the ability of the agencies to carry out their mission

F. ASSUMPTIONS AND LIMITATIONS

This research, like all others, makes some assumptions. Two assumptions are being made: (1) The phases of the contracting process are the same across the board for each Navy activity and DoD contractor, and (2) experience and knowledge is comparatively similar in each of the activities. Because of the similarities between the DoD and DoD contractors, as well as the unique nature of defense contracting, it safe to assume that the respective organizations operate in a similar fashion.

In research projects, it is virtually impossible to capture every aspect of knowledge, information, fact, or opinion regarding a topic. As a result, the following assumptions apply:

- Report is constrained by the inconsistent number of survey results received from the different activities, and therefore sample sizes will vary.
- Due to the nature of the open-ended survey, discretion is necessary to interpret each participant's response.
- There is a limited number of contracting organizations: three Navy and two defense contractors.
- This voluntary survey depends on the respondents being truthful and honest.

G. SIGNIFICANCE OF STUDY

The objective of this research is to analyze survey results obtained from both civilian and Navy contracting activities and determine whether any significant correlation in CSFs exists. The research conducted could prove to be a vital asset within the Navy contracting process and as a result, share some of the same benefits many private companies have experienced in the past. Identification of CSF will provide the Navy and the Department of Defense areas to enhance contract management capabilities and project management capabilities. The government has taken notice of this and spent vital resources identifying CSFs within Project Management (GAO, 2011), yet little research specific to contracting has been conducted. Contract and project management are integrally related, since both typically include planning, awarding, and administering contracts for the performance of the project-related effort. The identification of CSFs in

regards to contract management should lead to an intensive study of how they affect the contracting aspect of project management. The focus of this research will further the academic study of CSFs in relation to contracting actions within the specified Navy contracting activities and private industries.

H. ORGANIZATION OF RESEARCH REPORT

This research is organized as follows: Chapter I consists of the introduction to include: the background, the purpose of the study, statement of the pertinent research questions, methodology, assumptions and limitations, significance of the study, organization of the research paper, and a summary. Chapter II will discuss a review of the literature on CSFs from a broad perspective, followed by an in-depth look into the correlation between Navy Contracting and CSFs. Chapter III will focus on the case study and the Navy Contracting process. Chapter IV will discuss the methodology used to conduct the statistical analysis. Chapter V is an analytical review of the survey results to include a regression analysis that will determine any statistically significant correlation between the three activities, two DoD contractors the importance of the report. Finally, Chapter VI will conclude with a summary of this research, importance of the report and recommendations of areas for further research.

I. SUMMARY

This chapter provided an introduction to include the background, the purpose of the study, the problem statement, research questions, assumptions and limitations, methodology, the significance of the study and the organization of the research paper. This chapter has set the stage for the research. Chapter II will review the relevant literature on the concept of CSFs.

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II. LITERATURE REVIEW

A. INTRODUCTION

This chapter provides a literature review of the concept of Critical Success Factors (CSFs). The literature review is presented in four sections. The first will be an origin of the research of CSFs. The second covers industries' use of CSFs. The third will discuss the use of CSF in other government agencies. The fourth section will discuss literature associated in government contracting and the use of CSFs.

B. DEVELOPMENT OF CRITICAL SUCCESS FACTORS RESEARCH ORIGIN

With so many important matters a supervisor must tend to on a daily basis, it becomes difficult to recognize every problem that arises within the organization. It is even harder to keep personnel focused on the most important aspects within the organization. In these situations, the use of CSFs could potentially be beneficial by helping to mitigate these problematic situations and ultimately enhance the mission of the organization.

The first reference to CSFs originates from the concept of a limited factor, observed by Commons (1934). This was referred to as a Key Success Factor (KSF). Within the field of strategic management, the definition of KSF is closely related to the CSF concept. This study defined KSF as follows: KSF is the key competitive advantages to be possessed by companies when facing changes of industrial environments (as cited in Peng, 2005). The idea of a limited factor has been used in many other fields of study as well.

The term "Critical Success Factor" was not proposed in a formal manner until 1961. In "Management Information Crisis" Daniel, states in a Harvard Business Review article that (Daniel, 1961):

> Companies were plagued by a common problem: inadequate management information. The data were inadequate, not in the sense of there not being

> enough, but in terms of relevancy for setting objectives, for shaping alternative strategies, for making decisions, and for measuring results against planned goals. (p. 117)

His idea was based on the premise that a company needed an assemblage of environmental, competitive and internal information provided by financial and nonfinancial data in the form of "success factors." In general, the number of CSFs for success in an organization should not exceed seven. To that end, the concept of CSFs did not catch on for nearly two more decades (Brudan, 2010).

John F. Rockhart, who is a professor at the Sloan School of Management at M.I.T, went on to define CSFs in detail (Rockart 1979). He identifies the use of CSFs in helping executives define their informational needs. The concept of CSFs has evolved significantly since 1979 and is used extensively to help organizations implement vision, objectives and projects.

C. INDUSTRY USE AND ANALYSIS OF CRITICAL SUCCESS FACTORS

It is believed that by identifying and codifying your CSFs, an organization would be able to create a common point of reference, subsequently allowing the organization to direct and measure the success of a project. Having this common point of reference allows the organization to identify what is most important to its success.

Rockart (1979) defines CSFs as the "limited number of areas in which results, if they are satisfactory, will ensure successful, competitive performance for the organization. They are the few key areas where things must go right for the business to flourish. If results in these areas are not adequate, the organization's efforts for the period will be less than desired" (p. 81). Additionally, he states, "These are areas of activity that should receive constant and careful attention from management" (p. 81). This is to ensure the greatest opportunity of success within an organization. Due to these factors being the highest value to an organization, managers should have correct and current information, so the best path can be chosen.

Rockart has subsequently refined the definition and meaning of CSFs in many studies. Rockart and Bullen (1981) discuss the important areas of modeling and

identifying those CSFs. The first item a manger should engage is the interview process to gather data. Secondly, the manager needs to be able to analyze the data. This will be broken down in detail below.

According to Rockart and Bullen (1981) in the three years of utilizing their interview method, the following are most successful in drawing out CSFs: preparation and skill. This is the way the interviewer conducts the interview, which should be done skillfully. The interviewer will be knowledgeable about the areas discussed in the interview. It will be of little value to the organization if the interviewer is not from that department or familiar with the business plan of the organization. The interview should be a brainstorming session vice a direct interview. This is so there can be a healthy exchange of ideas. It also provides the interviewer immediate feedback to what the person being interviewed feels.

Analysis of the data is of equal importance when studying CSFs within any industry. In order to identify CSF, Esteves (2004) states that a wide array of research methods can be used. For instance, the realization of case studies (e.g., Sumner, 1999), group interviews (e.g., Khandewal & Miller, 1992), structured interviews (Rockart & Bullen, 1981), as well as the analysis of relevant literature (e.g., Esteves & Pastor, 2000) defined how these methods can be used. According to Shah and Siddiqui (2002; Amberg, M. Fischl, F. & Wiener, M. 2005), the most frequently used method to identify CSFs is the use of a questionnaire.

Reflecting on the evolution in CSF research, several different CSF vectors of research have emerged in literature over the course of the years. In the following, the most common dimensions according to Esteves (2004) will be reviewed.

1. Hierarchy vs. Group of CSFs

Rockart (1979), defines a specific hierarchy of CSFs that is primarily based upon the organizational level at which the individual strategic issues are discussed. In line with this particular approach, CSFs can be addressed on either an industry, corporate, or sub organizational level, thereby forming a certain type of CSF hierarchy within the organization (Rockart & Bullen, 1981). While a predefined level structure is dominant

within the hierarchy suggested by Rockart (1979), Barat (1992); Amberg, M. Fischl, F. and Wiener, M. (2005) argue that the hierarchy of CSFs may also be built upon logical dependencies, such as those existent between business aims and the factors influencing these aims.

Additionally, the hierarchical approach is extended to include groups of CSFs. In this approach, either CSFs for a collection of organizations belonging to the same particular industry or CSFs for a group of managers in a particular occupation belonging to different organizations are identified. As a result, the idea of generic CSF for these particular groups is addressed (Esteves, 2004).

2. Temporary vs. Ongoing CSFs

According to Ferguson and Khandewal (1999), CSF can be of either a temporary or ongoing in nature. One example of an ongoing CSF is the existence and influence of a particular project manager, because he or she influences all stages of a particular project. Conversely, the definition of the project is defined by its temporary nature, which is only regarded as critical for a certain period. In this context, Ferguson and Khandewal (1999) note that all CSFs can be defined in a way that makes them temporary. That being said, CSFs may differ in their individual degree of temporality, some spanning years while others only months. The key is to identify and recognize their individual relevance for different stages within a project's lifecycle.

3. Internal vs. External CSFs

The dimension of which CSFs are internal or external to the particular organization or unit in which they are applied can further distinguish CSFs. Arce and Flynn (as cited in Amberg, M. Fischl, F. & Wiener, M. 2005), state that, "an internal CSF has related actions taken within the organization, while an external CSF has related actions performed outside the organization." As a result, internal CSFs are linked to issues within a manager's range of control, whereas the manager may not exclusively control external CSFs.

According to Rockart (1979), the relevance of this CSF dimension is particularly high when determining the proper sources of information within a process of data collection.

4. Building vs. Monitoring CSFs

Building and monitoring CSFs refer, on the one hand, to the amount of control on the part of management and on the other hand, to the monitoring or building nature of the actions taken. According to Arce and Flynn (as cited in Amberg, M. Fischl, F. &Wiener, M. 2005), "a monitoring CSF is concerned only with monitoring an existing organizational situation [whereas] a building CSF is concerned with changing the organization or with future planning" (p. 312). For instance, the maintenance of technological leadership would be a CSF that a company could build and control, while changing consumer demographics would represent a CSF, which needs to be monitored, but not controlled (Esteves, 2004).

In a similar approach, Bullen and Rockart (1981) distinguish between building CSFs, used to achieve certain goals or implement a certain degree of change in performance, and monitoring CSFs, used to monitor key issues over a larger period. Such long-term monitoring is often closely related to the strategic and tactical CSF dimension.

5. Strategic vs. Tactical CSFs

This element focuses on the type of planning, which takes place within an organization, thereby differentiating between strategic and tactical CSFs. According to Esteves (2004), while strategic factors seek to identify which are the appropriate goals to be achieved, the tactical factors describe possible alternatives concerning the method these goals can be met. Strategic factors, although based on opportunities, often contain a great amount of risk and, therefore, require long term planning primarily executed by senior executives. On the contrary, tactical factors deal with resources required to reach the goals described in the strategic level and only call for a short or medium term planning effort, most often performed by the middle management. According to Ward (as cited in Amberg, M. Fischl, F. & Wiener, M. 2005), "there will normally be a mixture of tactical and strategic CSFs. If they are all strategic, the business might flounder in the

short term while everybody concentrates on the blue skies ahead. Equally, if all CSFs are tactical, the business might burn out like a super-nova" (p. 117).

6. Perceived vs. Actual CSFs

The identified CSF in one organization does not necessarily apply to all other organizations. Rather, each individual company must align their CSFs in accordance with their own specific goals and needs. This is where the final dimension comes into play, distinguishing between perceived and actual CSFs. Initially proposed by Ellegard and Grunert (as cited by Amberg, Fischl, and Wiener, 2005), the concept of perceived versus actual CSFs could bring useful implications by shedding light on the knowledge concerning discrepancies between actual and perceived CSFs. Experience in this field could for instance, lead to more stable strategy formulations and implementations.

Though the measurement of CSF may not be possible, Dess and Robinson (1984) suggest a more frequent confrontation of key decision makers with these factors. By doing this, decision makers might win insight on their perceptions concerning both truly relevant CSFs and those only perceived as such.

D. THE BENEFITS OF IDENTIFYING CRITICAL SUCCESS FACTORS

According to Rockart (1979), the following benefits exist for managers when applying the CSF approach:

> The process helps the manager to determine those factors on which he or she should focus management attention. It also helps to ensure that those significant factors will receive careful and continuous management scrutiny.
>
> The process forces the manager to develop good measures for those factors and to seek reports on each of the measures. The identification of CSF allows a clear definition of the amount of information that must be collected by the organization and limits the costly collection of more data than necessary. The identification of CSF moves an organization away from the trap of building its reporting and information system (IS) primarily around data hat are 'easy to collect.' Rather, it focuses attention to those data that might otherwise not be collected but are significant for the success of the particular management level involved. The process acknowledges that some factors are temporal and that CSF is manager

> specific. This suggests that the IS should be in constant flux with the new reports being developed as needed to accommodate changes in the organization's strategy, environment or organization structure. Rather than changes in an IS being looked on as an indication of 'inadequate design', they must be viewed as an inevitable and productive part of IS development. (p. 87)

In consideration of Rockart, according to Esteves (2004), the CSF concept itself can be used for more than only IS design. This is also reflected in a number of studies that suggest identifying CSFs can benefit the whole management process.

E. THE RELEVANCE OF CRITICAL SUCCESS FACTORS TO DOD CONTRACTING

Pinto and Prescott presented the idea that "the majority of the studies in the critical success factor research stream have been theoretical and have assumed a static view of the importance of various factors over the life of a project. In other words, a critical success factor was assumed to have the same degree of importance throughout the life of a project" (p. 5). Following the examination of the criticality of CSFs throughout the lifecycle of a project, they concluded that the degree of criticality of a CSF is subject to change during the different stages of a project lifecycle.

Over the years, the number of studies dedicated to examining the significance of CSFs concerning the individual elements of the project lifecycle has increased dramatically from the initial study form by Rockart in 1979; most studies remain limited to the sole identification of CSF. However, these studies do not address their individual degree of relevance. There have been a limited number of in-depth studies attempting to identify and judge the relevance of CSFs. The approach implemented by Pinto and Prescott (1988) is based upon the same set of CSFs at all times, while examining their individual degree of criticality along the different project phases. On the opposite end of the spectrum, other researchers have chosen to define different sets of CSFs for each project phase. Though both approaches have a different method of implementation, they usually refer to the same set of CSFs.

According to Esteves (2004), in order to define CSFs significance, researchers most frequently use case studies as well as surveys based on interviews. Almost

exclusively, the participants are asked to either create a list of the most relevant CSFs for each project phase or examine the relevance of individual CSFs, using a scale, which indicates a low, normal or high relevance.

F. CRITICAL SUCCESS FACTORS IN PROJECT MANAGEMENT AND ACQUISITION PROCESS

In the Department of Defense (DoD), there is an extreme amount of focus on project management and the acquisition process. A quick title search will lead the reader to numerous Government Accountability Office (GAO) and Inspector General (IG) reports that document mistakes that the DoD has had with project management. These reports often identify what factors could have led to success in management of the program and because acquisition is closely related, it could reasonably be assumed that these same factors would work in contract management. These reports have been used to discern successful practices. What is not defined, however, is the relevancy of each factor, or even what factors are important to each project. Additionally the definition of successes can be different for each level of an organization. A GAO report (2006) made the following observation:

> At DoD, success is often formally defined in similar terms as the commercial world: deliver high quality products to customers (the warfighter) at the right time and the right cost. Virtually all program managers we spoke with first defined success in terms of enabling warfighters and doing so in a timely and cost-efficient manner. But when the point was pursued further, it became clear that the implied definition for success in DoD is attracting funds for new programs, and keeping funds for ongoing programs. Program managers themselves say they spend enormous amounts of time retaining support for their efforts and that their focus is largely on keeping funds stable. They also observe that the DoD starts more programs than it can afford to begin with, which merely sets the stage for competition and resulting behaviors. As noted earlier, there are factors that contribute to how success is defined in practice, including the fact that DoD depends on annual appropriations and it must fund a wide variety of missions beyond weapon systems development.

For every stakeholder in the acquisition process, “success” could have a distinctly different meaning. How can we expect to produce successful programs when we cannot

agree on the definition of success? Although it is difficult to define a successful program in a way that would satisfy every stakeholder, it is an important question that must be addressed in order to create a more efficient acquisition process (Harris, 2006).

Though most people realize the importance of CSFs in project management, according to Dobbins and Donnelly (2004), it would be difficult, if not impossible to determine the constraints underlying top management support, client consultation, project mission, trouble shooting and well defined schedule/plan. In addition, there has been discussion on how an organization could be effectively measured. Contextually it would be difficult as well, since one would have to have a complete set of CSFs for the supporting activities. Additionally, Ang and Sum (1997) and Dobbins and Donnelly (2006), reviewing previous studies regarding the definitions of CSFs, stated they were too broad to provide any useful and meaningful guidelines for material requirements planning implementation.

According to Rendon (2010), the project management literature also provides some insight on critical factors for project success. There are additional discussions on the true definition of project success. According to Dobbins and Donnelly (2006), there is always a difficulty for a project manager to identify what his or her general set of CSFs should be without consideration for the project itself. Namely, success on one project could be defined much different from another project. Take, for example, weapons system acquisition. If a project manager had a Cost Reimbursement type contract, the project would be considered successful if the objectives were achieved. On the other hand if, an acquisition was being pursued using a Fixed Price approach, the project would be considered successful only if it met the cost objectives and the customer received a satisfactory product or service.

To that end, there has been much discussion of program success. It has been hypothesized that project manager selection, project termination, and top management support as factors identified related to project failure, this will potentially give a different perception of what is considered project success (as cited in Rendon, 2010). Conversely (as cited in Rendon, 2010), the actual success and failure for a particular project and conclude that a project manager's performance is related to the size of manager's

previous project, as opposed to the actual experience level of the program manager. There has been research conducted by Rubin and Seeling (1967); Rendon (2010) that lead credence to this claim. Often a project is considered a success as long as it meets cost, schedule, and performance. Baker, Murphy, and Fisher (1983) instead offer up the notion of using perceived performance as the measure of success or failure. There are also other views on what people perceived as a project success. Baccarini (1987) developed a logical framework for defining whether a project was a success or not and consists of four levels: goal, purpose, output, and input. These four levels are distributed between product success as well as project management success. In contrast, Hughes (1986), Rendon (2010), and Morris and Hough (1987), identify categories of project success factors (strategic and tactical) and the impact these categories have on the project during the various project management phases. Pinto and Mantel (1988) suggest that these CSFs applied to a wide variety of project types and organizations. Belassi and Tukel (1996) provided a much different view for a project CSFs, grouping them into four categories—project-related, project team/manager related, organization-related, and external environment related.

Rendon (2010) conducted an analysis of previous studies of CSFs related to project success and singled the top six factors: Planning (integrative), monitoring and control (integrative), team selection and technical performance, communication, leadership, strategic direction and team development, monitoring and control (risk), organizational support, and stakeholder management (other), organizational structure, and, project definition and stakeholder management (client). Frame (1999) studied and identified the key factors that lead to organizational competence in regards to project management: Clearly defined and well-formulated procedures for performing work, access to information needed to perform work effectively, sufficient quantities of human and material resources, opportunities for training and education, clearly defined visions of the organization's future, a culture of openness, and institutionalization of project management.

A survey of over 150 project management professionals (as cited in Rendon 2010) identified fifteen critical factors for project success. This open-ended question sought

opinions of what factors are critical to achieve project success. The aim was to identify similarities between literature and responses and to add to the body of knowledge on CSFs. The literature review identified nine general CSFs and fifteen CSFs discerned from the respondents' replies.

G. CRITICAL SUCCESS FACTORS IN CONTRACT MANAGEMENT

The study of CSFs in acquisition, specifically within contract management, is not very extensive. When discussed, it normally pertains to the project management aspect of procurement. Rendon (2010) illustrates that research conducted in contract management CSFs is not as extensive as project management. Angeles and Nath (2007) conducted research to identify CSFs for the implementation of business-to-business e-procurement best practices, which included the identification of three CSFs:

- Supplier/contract management
- End-user behavior/ E-procurement business processes
- Information and E-Procurement Infrastructure

In the studies conducted by Trent and Monczka (1994), the research primarily focused on identifying CSFs for cross-functional sourcing teams such as organizational resources, supplier involvement, decision-making authority, and team leadership. Many of the themes identified have applications with the contracting arena. In DoD contracting, it is imperative that the CSFs identified are those that will have the most positive impact on the success of the organization.

Rendon (2009, 2010) identified five contract management organizational best practices categories: process strength, successful results, management support, process integration, and process measurement. Any one or all of these categories combined could be a good starting point for CSF analysis. In addition, Cohen and Eimicke (2008), identify twenty problems in government contracting that fall into the following five categories:

- Problems relating to letting contracts
- Communication issues

- Contractor internal management issues
- DoD contract management issues
- Environment or external issues

To identify CSFs within various contracting agencies within the Navy and vendor subcontract management, the following categories are used (Rendon, 2010): workforce, processes, relationships, resources, leaderships, policies, and requirements. These categories are broad and can be broken down with more specificity. In the previous study of Rendon (2010), he stated responses in the Workforce category were related to the specific workforce expertise of contracting such as, training, organization, experience, promotion, and mentoring. The Processes category discussed having documented, standardized, consistent, efficient, and effective, enforced, and streamlined contracting processes. The Relationships category included statements concerning cooperation among acquisition team members and end-users, coordination and support from program offices, good working relationships with contractors, trust, and collaboration. The Resources category consists of a wide variety of various resources needed in the contracting process such as automated contract writing systems, contract-tracking tools, and other information technology resources. Also included in this category were facilities, equipment, supplies, technical support, and logistical support, as well as adequate travel funds. Leadership relates to the need for strong, empowered leadership and management support, quick decision-making, clear lines of authority, and people-oriented management. The Policies category is related to updated, clear, concise, uniform guidance, directions, and regulations. The Requirements categories consist of items related to complete, timely procurement request packages and others that are specific to requirements generation (Rendon, 2010).

H. SUMMARY

Though the idea of CSFs has been around for many years first in the form of Key Success Factors and later in a more codified format by Daniel, the aggregate research was not that robust until the 1980s when pioneers, such as Rockart and Bullen, first took interest in the topic. Originally, the concept of identifying a CSF was focused on

information systems, but as can be seen by numerous studies, there is an application to all forms of project management, which can be easily translated for implementation with the Department of Defense acquisition framework. Lastly, through research initiated and conducted by Rendon (2010), there will be a statistical analysis of CSF survey results conducted to test for similarities amongst the different contracting agencies. This analysis will help further the academic body for CSFs in contract management.

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III. ORGANIZATIONAL FRAMEWORK

A. INTRODUCTION

The previous chapter provided a literature review of Critical Success Factors (CSFs) and an overview of research conducted that included the origin and current usage of CSFs. The chapter concluded with analysis of the benefits the military could gain from incorporating CSFs in various contracting activities.

The purpose of this chapter is to provide a brief background of Navy Contracting. The chapter will then provide an overview of each of the participating Navy contracting agencies to include the size, annual number of contract actions, dollar value and an organizational chart illustrating how each agency is aligned within the Navy. The chapter will conclude with a brief overview of Department of Defense (DoD) contractors that includes a list of the top 50 in the United States and the top 50 contractors in the Department of the Navy.

B. NAVY CONTRACTING BACKGROUND

There are eleven major contracting commands within the Navy (DON, 2012), responsible for supporting the overall mission of the Navy by acquiring goods and services to meet specific requirements. In fiscal year 2009, the Navy purchased approximately 88 billion dollars of goods and services vis-à-vis these commands. The overall structure of the Navy's procurement process is decentralized with no single agency being responsible for the contracting process. Five of the eleven are major systems commands, responsible for providing total system integration, systems engineering, contracting, administrative and technical support and guidance and personnel and training support to the Navy. The Navy's eleven major contracting commands are as follows:

- Headquarters, U. S. Marine Corps
- Marine Corp Systems Command

- Military Sealift Command
- Naval Air Systems Command
- Naval Facilities Engineering Command
- Naval Inventory Control Point
- Naval Sea Systems Command
- Naval Supply Systems Command
- Office of Naval Research
- Space and Naval Warfare Systems Command
- Strategic Systems Programs

C. PARTICIPATING CONTRACTING AGENCIES

Rendon collected the survey results from the following three contracting agencies in 2009: NAVAIR, NAVSUP-GLS and NAVSEA (Rendon, 2009). The surveys attained from two defense contractors remain anonymous, but were included to determine any similarities between Navy contracting agencies and the DoD contractors.

Figure 1 illustrates where each system command falls within the Chief of Naval Operations organization chart, with the exception of NAVSUP-GLS, which falls under Naval Supply Systems Command (NAVSUP).

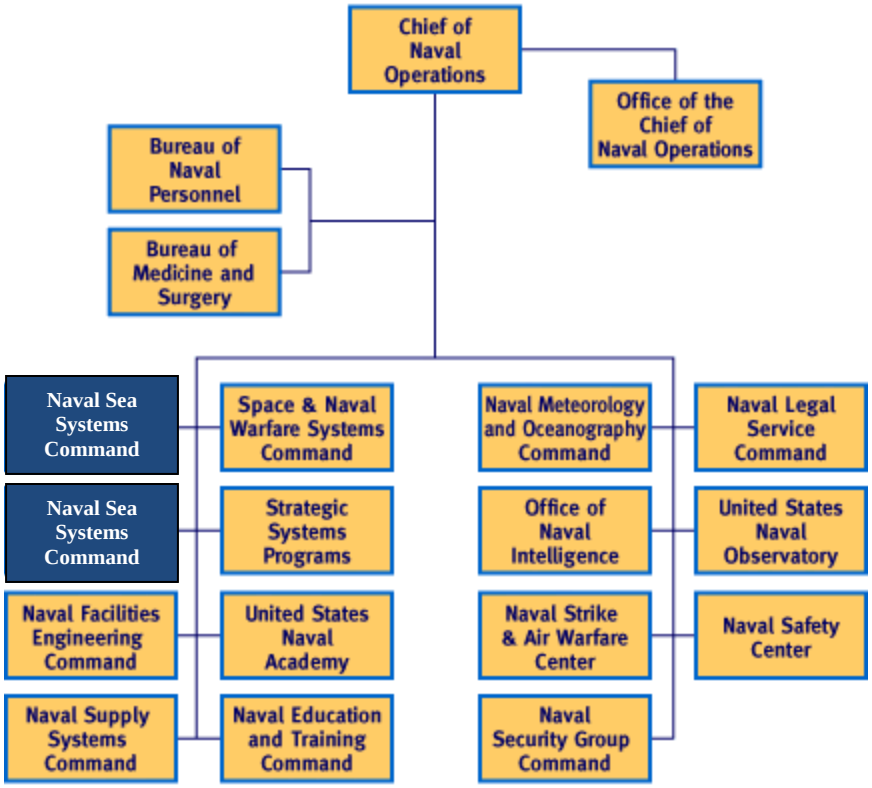
Chief of Naval Operations
Office of the Chief of Naval Operations
Bureau of Naval Personnel
Bureau of Medicine and Surgery
Naval Sea Systems Command
Space & Naval Warfare Systems Command
Naval Meteorology and Oceanography Command
Naval Legal Service Command
Naval Sea Systems Command
Strategic Systems Programs
Office of Naval Intelligence
United States Naval Observatory
Naval Facilities Engineering Command
United States Naval Academy
Naval Strike & Air Warfare Center
Naval Safety Center
Naval Supply Systems Command
Naval Education and Training Command
Naval Security Group Command

Figure 1. Chief of Naval Operations Organization Chart (From NAVSEA, 2012)

1. Naval Sea Systems Command

NAVSEA is responsible for engineering, building, purchasing and maintaining ships, submarines and combat systems that meet the fleets' current and future operational requirements (NAVSEA, 2012). Of the participating agencies in Fiscal Year (FY) 2011, NAVSEA had a budget 36.5 billion and conducted over 60,000 contract actions (NAVSEA, 2012). The following bullets provide an overview of NAVSEA's organization:

- NAVSEA is the largest of the Navy's five system commands. With a fiscal year 2008 budget of $24.8 billion, NAVSEA accounts for nearly one quarter of the Navy's entire budget.
- With a force of 53,000 civilian, military and contract support personnel, NAVSEA engineers, builds, buys and maintains the Navy's ships, submarines, and their combat systems.

- Contracts (SEA 02) and its field contracting offices under the Contracts Competency award nearly $24 billion in contracts annually for new construction ships and submarines, ship repair, major weapon systems and services.

2. Naval Air Systems Command

The mission of NAVAIR is to provide full life-cycle support of naval aviation aircraft, weapons and systems operated by Sailors and Marines. This support includes research, design, development, and systems engineering; acquisition; test and evaluation; training facilities and equipment; repair and modification; and in-service engineering and logistics support (NAVAIR, 2012). The following bullets provide an overview of NAVAIR's organization:

- NAVAIR Comptroller is responsible for strategic budgeting, accounting and all financial management for having an order of $41 billion in acquisition and sustainment funds annually to support the mission and an additional $5 billion working capital fund budget in support of the Naval Air Warfare and Fleet Readiness Centers.

- Approximately 33,000 military and civilian employees, four program executive offices, three warfare centers, and three aviation depots and one Logistics Support Activity.

- In 2007, NAVAIR had over 22,000 contract actions worth 23.4 billion dollars. (Kovack, 2009)

3. Naval Supply Systems Command-Global Logistics Support

Unlike NAVAIR and NAVSEA, NAVSUP-GLS is a subcommand under Naval Supply Systems Command.

Figure 2 is an organizational chart illustrating NAVSUP's breakdown of command responsibilities and where NAVSUP-GLS ranks.

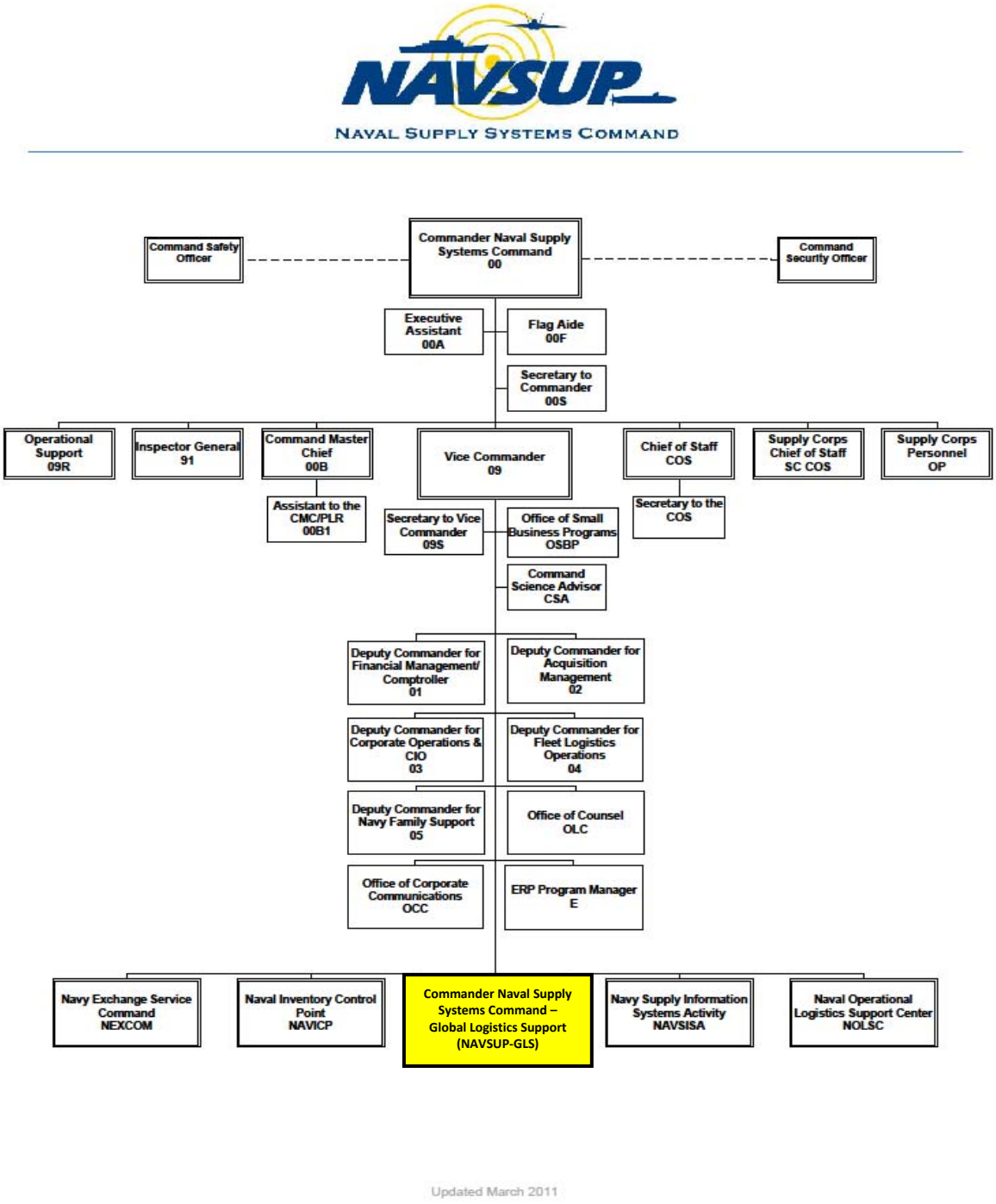
NAVSUP
NAVAL SUPPLY SYSTEMS COMMAND
Command Safety Officer
Commander Naval Supply Systems Command 00
Command Security Officer
Executive Assistant 00A
Flag Aide 00F
Secretary to Commander 00S
Operational Support 09R
Inspector General 91
Command Master Chief 00B
Vice Commander 09
Chief of Staff COS
Supply Corps Chief of Staff SC COS
Supply Corps Personnel OP
Assistant to the CMC/PLR 00B1
Secretary to Vice Commander 09S
Office of Small Business Programs OSBP
Secretary to the COS
Command Science Advisor CSA
Deputy Commander for Financial Management/ Comptroller 01
Deputy Commander for Acquisition Management 02
Deputy Commander for Corporate Operations & CIO 03
Deputy Commander for Fleet Logistics Operations 04
Deputy Commander for Navy Family Support 05
Office of Counsel OLC
Office of Corporate Communications OCC
ERP Program Manager E
Navy Exchange Service Command NEXCOM
Naval Inventory Control Point NAVICP
Commander Naval Supply Systems Command – Global Logistics Support (NAVSUP-GLS)
Navy Supply Information Systems Activity NAVSISA
Naval Operational Logistics Support Center NOLSC
Updated March 2011

Figure 2. NAVSUP Organizational Chart (From NAVSUP, 2012)

NAVSUP-GLS is a field activity that falls under the Navy Field Contracting System (NFCS) and can exercise unlimited contracting authority. The Commander Naval Operations on August 1, 2006 to focus on global logistics and contracting issues and to drive best practices under across the seven Fleet Logistics Centers formally established NAVSUP-GLS. The following bullets provide an overview of NAVSUP-GLS's organization (NAVSUP-GLS, 2012):

- NAVSUP-GLS serves as the lead for NAVSUP's operational alignment initiative to support the numbered fleets and integrate and align NAVSUP's planning, training, and exercise engagement efforts in support of operational requirements.

- NAVSUP-GLS, headquartered in San Diego, Calif., comprises more than 5,700 military and civilian logistics professionals, contractors and foreign nationals operating as a single cohesive team and providing worldwide integrated logistics and contracting services to Navy and Joint operational units across all warfare enterprises, and base supply functions at 70 shore locations.

- During an average fiscal year, NAVSUP-GLS will complete between 85,000 and 88,000 contracting actions and valued between 3.6 and 4.4 billion dollars annually (NAVSUP, 2012).

Contracting workforce and processes are optimized to meet customer requirements. Contract authority thresholds were within NAVSUP and delegated to NAVSUP-GLS commensurate with contracting office capabilities and level of leadership oversight required. These delegations clearly delineate Headquarters Contracting Authority policy and oversight responsibilities residing at NAVSUP, with execution responsibilities residing with NAVSUP-GLS.

4. Defense Industry

A DoD contractor is a business organization or individual that provides products or services to the DoD. Products typically include military aircraft, ships, vehicles, weaponry, and electronic system. Services can include logistics, technical

support, and training and communications support. All branches of the military rely heavily on defense contractor support to meet mission objectives and support the War Fighter.

As the combat systems have become more complex and the nature of the Department of Defense's mission has evolved, there has been a much larger reliance on contractors to accomplish work. In 2010, the top 200 federal contractor received over $543 billion in revenues from the United States government (Government Executive, 2010, FPDS-NG 2011). Table 2 lists the top fifty contractors based on the combined total monies received from federal government. According to the Federal Data Procurement Systems in fiscal year 2011, the Navy alone had 97, 383 completed actions totaling over $80 billion (FPDS-NG, 2011). Table 3 lists the top fifty contractors utilized by the Department of the Navy. With these numbers of actions and monies involved, it is important to understand what CSFs that DoD contractors find valuable. This will allow for better understanding of those firms by the contracting agencies and could allow the alignment of processes.

The surveys provided by Rendon were received from two companies within the Defense Industry. Each of the companies shall remain anonymous throughout the research. The survey results will provide useful insight into the defense contracting industry and will be used to determine any similarities to the Navy contracting agencies.

Table 2. Top 50 Federal Contractors Utilized by the Department of Defense (From Government Executive, 2010)

Global Vendor Name	Total Actions	Total Dollars
LOCKHEED MARTIN CORPORATION	21,700	$35,828,421,340.83
THE BOEING COMPANY	14,039	$19,486,294,255.83
NORTHROP GRUMMAN CORPORATION	19,587	$16,797,921,451.22
GENERAL DYNAMICS CORPORATION	17,934	$15,249,055,811.75
RAYTHEON COMPANY	11,228	$15,245,234,506.52
UNITED TECHNOLOGIES CORPORATION	13,499	$7,721,459,648.98
L-3 COMMUNICATIONS HOLDINGS INC.	15,171	$7,445,106,575.43
OSHKOSH CORPORATION	4,660	$7,243,489,906.25
SAIC INC.	28,807	$6,796,280,361.66
BAE SYSTEMS PLC	13,624	$6,561,185,112.84
CERBERUS CAPITAL MANAGEMENT L.P.	3,188	$4,768,901,697.89
MCKESSON CORPORATION	22,247	$4,601,060,051.58
COMPUTER SCIENCES CORPORATION	5,920	$4,372,553,085.04
URS CORPORATION	5,570	$3,947,003,912.81

Global Vendor Name	Total Actions	Total Dollars
BECHTEL GROUP INC.	285	$3,939,025,644.12
BOOZ ALLEN HAMILTON HOLDING CORPORATION	9,137	$3,748,607,534.52
KBR INC.	617	$3,625,557,555.82
HARRIS CORPORATION	7,092	$3,301,564,466.11
HUMANA INC.	545	$3,248,780,847.62
HEALTH NET INC.	424	$3,224,143,073.24
GENERAL ELECTRIC COMPANY	9,311	$3,134,833,212.85
ITT CORPORATION	3,803	$2,814,320,312.00
BELL BOEING JOINT PROJECT OFFICE	1,306	$2,752,694,557.21
TRIWEST HEALTHCARE ALLIANCE CORP.	288	$2,721,404,316.04
GOVERNMENT OF CANADA	1,470	$2,678,746,839.33
CACI INTERNATIONAL INC	4,244	$2,634,468,461.90
HONEYWELL INTERNATIONAL INC.	8,205	$2,432,045,145.40
BATTELLE MEMORIAL INSTITUTE INC	3,109	$2,329,849,622.35
TEXTRON INC.	6,166	$2,216,419,550.86
LOS ALAMOS NATIONAL SECURITY LLC	50	$2,204,845,560.14
ALLIANT TECHSYSTEMS INC.	2,161	$2,197,273,707.88
SUPREME GROUP HOLDING SARL	21,768	$2,122,754,640.03
JACOBS ENGINEERING GROUP INC.	4,543	$2,059,889,624.46
FLUOR CORPORATION	738	$1,905,633,027.45
ABU DHABI NATIONAL OIL COMPANY FOR DISTRIBUTION	3	$1,895,207,544.00
NAVISTAR INTERNATIONAL CORPORATION	1,761	$1,888,875,971.66
GENERAL ATOMIC TECHNOLOGIES CORPORATION	746	$1,862,745,579.30
UNITED SPACE ALLIANCE LLC	85	$1,807,836,968.19
HEWLETT-PACKARD COMPANY	16,790	$1,767,768,233.93
CREATIVE ASSOCIATES INTERNATIONAL INC.	43	$1,767,520,077.44
DELL INC.	16,895	$1,714,725,489.36
MANTECH INTERNATIONAL CORPORATION	1,737	$1,703,119,783.03
CALIFORNIA INSTITUTE OF TECHNOLOGY	2,008	$1,663,548,743.03
INTERNATIONAL BUSINESS MACHINES CORPORATION	3,829	$1,653,157,521.11
EVERGREEN INTERNATIONAL AIRLINES	1,157	$1,612,054,323.80
UT-BATTELLE LLC	183	$1,552,706,037.82
LAWRENCE LIVERMORE NATIONAL SECURITY LLC	80	$1,532,081,365.89
APPTIS HOLDINGS INC.	3,967	$1,519,667,910.49
FINMECCANICA SPA	2,904	$1,500,809,378.99

Table 3. Top 50 Navy Contractors (From Government Executive, 2010)

Global Vendor Name	Number Of Actions	Dollars Obligated
LOCKHEED MARTIN CORPORATION	4,839	14,637,399,734.21
GENERAL DYNAMICS CORPORATION	7,409	13,077,820,514.02
NORTHROP GRUMMAN CORPORATION	6,001	6,664,078,979.85
THE BOEING COMPANY	1,704	6,388,559,519.60
RAYTHEON COMPANY	2,837	3,505,364,962.83
BAE SYSTEMS PLC	5,183	2,937,545,423.45
BELL BOEING JOINT PROJECT OFFICE	1,017	2,489,109,152.83
UNITED TECHNOLOGIES CORPORATION	1,243	2,266,741,869.26
HUNTINGTON INGALLS INDUSTRIES INC.	2,083	2,208,700,667.83
BECHTEL GROUP INC.	43	2,122,382,365.94
HEWLETT-PACKARD COMPANY	16,071	1,499,124,409.48
COMPUTERSHARE LIMITED	34	1,365,024,559.00

Global Vendor Name	Number Of Actions	Dollars Obligated
SAIC INC.	5,016	1,345,612,618.15
L-3 COMMUNICATIONS HOLDINGS INC.	4,359	1,257,010,766.26
GENERAL ELECTRIC COMPANY	1,271	1,153,650,823.01
NAVISTAR INTERNATIONAL CORPORATION	116	1,122,404,704.35
TEXTRON INC.	510	790,340,922.29
JOHNS HOPKINS UNIVERSITY	837	668,550,638.68
COMPUTER SCIENCES CORPORATION	1,165	633,632,283.67
BOOZ ALLEN HAMILTON HOLDING CORPORATION	1,230	550,418,670.98
ITT CORPORATION	948	541,313,183.11
CACI INTERNATIONAL INC	1,436	536,919,546.09
ROLLS-ROYCE GROUP PLC	336	529,588,682.65
URS CORPORATION	1,465	473,657,961.43
OSHKOSH CORPORATION	542	398,971,202.17
THE CHARLES STARK DRAPER LABORATORY INC	56	384,212,183.63
ROCKWELL COLLINS INC.	727	358,169,463.24
HARRIS CORPORATION	975	322,420,342.58
MARITIME HELICOPTER SUPPORT COMPANY LLC	12	290,954,352.50
ALLIANT TECHSYSTEMS INC.	334	290,671,539.72
GENERAL ATOMIC TECHNOLOGIES CORPORATION	71	256,692,014.86
NAVMAR APPLIED SCIENCES CORPORATION	138	253,191,378.22
HONEYWELL INTERNATIONAL INC.	1,240	248,606,761.32
SCIENTIFIC RESEARCH CORP	945	242,823,383.93
HENSEL PHELPS CONSTRUCTION CO	65	220,739,219.08
THE PENNSYLVANIA STATE UNIVERSITY	437	220,186,678.06
DCK/TTEC LLC	12	219,530,754.22
HARPER CONSTRUCTION COMPANY INC.	54	209,576,892.87
FINMECCANICA SPA	511	203,557,443.02
ALION SCIENCE AND TECHNOLOGY CORPORATION	584	202,246,021.41
CHUGACH ALASKA CORPORATION	1,142	193,976,787.59
SERCO GROUP PLC	1,091	193,139,692.86
SODEXO	49	192,536,505.50
AFOGNAK NATIVE CORPORATION	2,781	184,105,138.08
CERBERUS CAPITAL MANAGEMENT L.P.	773	182,421,129.50
SAUER HOLDINGS INC.	147	166,264,366.52
GROUPE CGI INC	468	165,276,184.81
QINETIQ GROUP PLC	465	164,489,948.72
OCEAN SHIPHOLDINGS INC.	55	161,550,527.19

D. SUMMARY

This chapter began with a brief overview of Navy Contracting and provided a background of each organization used throughout the research. The chapter provided an overview of each of the participating Navy contracting agencies and illustrated how each agency is aligned within the Navy. The chapter concluded with a brief overview of DoD contractors. Chapter IV will discuss the methodology used in the report and provide an overview of how participants were selected and the minimum requirements to do so.

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IV. METHODOLOGY

This chapter will discuss the rationale for selecting each of the agencies included in the report. The chapter will then provide an overview of how the participants were selected, including selection criteria, methodology and qualification level each participant must have achieved. The chapter will conclude with a breakdown of how the responses were categorized.

A. RATIONALE FOR AGENCY SELECTION

NAVAIR and NAVSEA were selected for this research because they are two of the five major systems commands within the Navy. NAVAIR and NAVSEA are responsible for managing nearly a nearly $60 billion combined annual budget. Each of the commands' contracting agencies is responsible for procuring extremely complex weapons systems and platforms, in addition to routine simple acquisitions of supplies and services. NAVSUP-GLS falls under Naval Supply Systems Command (NAVSUP) but has total authority in contract responsibilities. The three agencies represent and aggregate overview of Navy the contracting process. The data received provides a tremendous opportunity to examine what contracting employees believe to be the top five CSFs within their organization. The survey results received from the two anonymous defense contractors provide useful insight into the defense contracting industry and will be used to determine if there are any similarities or statistical correlation to the Navy contracting agencies' survey results.

B. PARTICIPANT SELECTION AND QUALIFICATIONS

The Navy participants chosen for the survey were selected based on their level of certification. Each participant was required to be a Warranted Contracting Officer with a Defense Acquisition Workforce Improvement Act (DAWIA) Level II certification at a minimum. Both their appointment as warranted contracting officers and DAWIA certification confirms that participants have a demonstrated level of education, experience, and experience in contract management (Kovack, 2008).

C. METHODOLOGY

Rendon conducted the survey in 2009 to capture a better understanding of what contracting personnel believe to be the top five CSFs within their organization (Rendon, 2010). The exact question presented to the participants was; "What are the top five CSFs needed to allow your organization to achieve its mission?"

The survey did not provide a list of options for the respondents to choose. Instead, each participant was allowed flexibility in answering the survey question, which in turn provided results that are more accurate. However, attempting to organize the data into similar categories in order to analyze was challenging. The number of responses (sample size) varied throughout the different agencies and not all participants provided useable data. Unless the answers were clear and concise, discretion was necessary when attempting to interpret the data, which introduced a minimal potential for error.

Of the data received, 638 total responses were used in the analysis to determine correlation between the different agencies. The remaining 150 answers were not used due to repetition of the same answer from one individual, unclear meaning of an answer, or simply not providing the requested five answers. In these cases, the responses were omitted from the research.

The first part of the analysis focused on organizing the data into a workable format. From there, we broke out each agency's smooth data into charts and diagrams to better illustrate the findings and provide a breakdown of categorical responses. We then conducted a regression analysis to test for any statistically significant similarities or differences between the agencies. Since the number of responses received from each agency varied, indicator variables were used in the regression analysis to reduce the effect of any one category. P-values representing statistical significance greater than 10 percent are not considered significant for this model, and therefore were not included in the results. Finally, R-squared values between 0 and 1 for each regression were shown to

indicate the strength of the relationship between the dependent and independent variables. Table 4 shows the categories, subcategories and subsequent coding that were used to organize the data.

Table 4. Coding Description of Category and Subcategories

Category	Subcategory	Code
Workforce		**W**
	Training	WT
	Organization	WO
	Experience	WE
	Promotion	WP
	Mentoring	WM
Process		**P1**
Relationships		**R1**
	Communication	RC
	Teaming	RT
	End-User	RE
Resources		**R2**
Leadership		**L**
Policy		**P2**
Requirements		**R3**

D. SUMMARY

This chapter began with a discussion of the rational for selecting each of the agencies included in the report. The chapter provided an overview of how the participants were selected, including selection criteria, methodology and qualification level each participant must have achieved. The chapter concluded with a breakdown of how the

responses were categorized. Chapter V will provide a statistical analysis of the data that will include a breakdown of total responses by category, results and an explanation of findings obtained from the analysis.

V. STATISTICAL ANALYSIS OF CRITICAL SUCCESS FACTORS

A. INTRODUCTION

The purpose of this chapter is to provide a statistical analysis of the survey results obtained from the research that will include charts, tables and an explanation of the findings. The chapter will begin with an explanation of each category and the number of responses per category provided from the contracting agencies and Department of Defense (DoD) contractors. The chapter will conclude with a complex regression analysis to determine statistically significant similarities or differences between each of the agencies.

B. CATEGORICAL BREAKDOWN

This section provides a breakdown of the seven Critical Success Factor categories and subcategories used in the analysis.

1. Workforce (32.1 percent)

The Workforce category, composed of five subcategories, accounted for the majority of the survey responses. Common responses included statements related to having an adequate number of personnel; proper staffing of vacant positions; continuous hiring and recruitment of personnel; and a trained, experienced, and competent workforce (Rendon, 2010).

The Workforce category constituted 205 of the 638 responses. Of the 205 responses, this category was broken down into subcategories of Workforce Organization (85 responses), Workforce Training (82 responses), Workforce Promotion (22 responses), Workforce Experience (14 responses) and Workforce Mentoring (2 responses). Common responses from the Workforce category included:

- Organization (WO): ‘Efficient staffing/manning to handle workload”
- Training (WT): “Adequate training for contracting professionals”

- Promotion (WP): "Promote/opportunities for workforce growth"
- Experience (WE): "Workforce maturity/experience"
- Mentoring (WM): "Mentoring"

2. Processes (17.4 percent)

The Processes category constituted 111 of the 638 responses. Responses included statements related to documented, standardized, consistent, efficient, effective, enforced, and streamlined contracting processes (Rendon, 2010).

The most common responses identified as Critical Success Factors in this category included standardizing processes, contract administration, better planning and flexibility. Also included in the responses were timely contract closeout, eliminating redundancy, more process monitoring and prioritization. A common response from the Processes category included:

- Processes (P1): "Standardize Processes"

3. Relationships (19.3 percent)

The Relationships category, comprised of three subcategories, accounted for the second largest number of survey responses. Responses within this category included cooperation among acquisition team members and end-users, coordination and support from program offices, good working relationships with contractors, trust, and collaboration (Rendon, 2010).

The Relationships category constituted 123 of the 638 responses. Of the 123 responses, this category was broken down into subcategories of Relationship Communication (50 responses), Relationship Teaming (49 responses) and Relationship End-Users (24 responses). These responses related to having a customer focus, providing customer training, educating the customer and understanding customer needs (Rendon, 2010). Common responses from the Relationships category included:

- Communication (RC): "Communication"
- Teaming (RT): "Cooperation between teams"
- End-Users (RC): "Focus on War-fighter success"

4. Resources (13.5 percent)

The Resources category consisted of 86 of the 638 responses. The responses in this category included "critical resources needed in the contracting process (Rendon, 2010). The most common responses identified as Critical Success Factors in this category included more funding, technical resources, efficient automation and IT systems such as SPS, ESM and FPDS. A common response from the Resources category included:

- Resources (R2): "Sufficient Funding"

5. Leadership (5.5 percent)

The Leadership category consisted for 35 of the 638 responses. The majority of the responses included in this category were knowledgeable and unbiased leadership, support from management, and a more reasonable amount of oversight. A common response from the Leadership category included:

- Leadership (L): "Senior leadership support"

6. Policies (7.4 percent)

The Policies category consisted of 47 of the 638 responses. The responses in this category included fewer levels of regulation and oversight, empowering personnel to perform, consistency among approving officials, more consistent and stable interpretation of policies from management, and more clearly stated objectives. A common response from the Policies category included:

- Policy (P2): "Limit layers of reviews/approvals"

7. Requirements (4.9 percent)

Of the 638 total responses received, the Requirements category represented 31. The category consisted of responses pertaining to more complete requirements packages, clearly defined requirements, timely identification and submission of the requirements and the quality of the requirements. A common response from the Requirements category included:

- Requirements (R3): "More clearly defined requirements"

C. PARTICIPATING ORGANIZATIONS

The mission of NAVAIR is to provide full life-cycle support of naval aviation aircraft, weapons and systems operated by Sailors and Marines. This support includes research, design, development, and systems engineering; acquisition; test and evaluation; training facilities and equipment; repair and modification; and in-service engineering and logistics support (NAVAIR, 2012).

NAVSEA is responsible for engineering, building, purchasing and maintaining ships, submarines and combat systems that meet the fleets' current and future operational requirements (NAVSEA, 2012). Of the participating agencies in Fiscal Year (FY) 2011, NAVSEA had a budget 36.5 billion and conducted over 60,000 contract actions (NAVSEA, 2012).

NAVSUP-GLS is a field activity that falls under the Navy Field Contracting System (NFCS) and can exercise unlimited contracting authority. NAVSUP-GLS was formally established by the Commander Naval Operations on August 1, 2006 to focus on global logistics and contracting issues and to drive best practices under across the seven Fleet Logistics Centers.

The surveys provided by Rendon were received from two companies (Contractor A and Contractor B) within the Defense Industry (2009). Each of the companies shall remain anonymous throughout the research. The survey results will provide useful insight into the defense contracting industry and will be used to determine any similarities to the Navy contracting agencies.

A DoD contractor is a business organization or individual that provides products or services to the federal government. Products typically include military aircraft, ships, vehicles, weaponry, and electronic system. Services can include logistics, technical support, and training and communications support. All branches of the military rely heavily on defense contractor support to meet mission objectives and support the War Fighter.

Table 5 displays the total number of results received by agency and Table 6 illustrates numbers by categories and subcategories. Of the data received, 638 total responses were used in the analysis to determine correlation between the different contracting organizations. The remaining 150 answers were not due to repetition of the same answer from one individual, unclear meaning of an answer, or simply not providing the requested five answers. In these cases, the responses were omitted from the research.

Table 5. Total Number of Responses by Contracting Organization

Organization	Number Used	Total	Percentage
NAVAIR	224	262	85.5%
NAVSEA	128	154	83.1%
NAVSUP-GLS	139	188	73.9%
Contractor A	69	80	86.3%
Contractor B	78	134	58.2%
Total	**638**	**818**	**78.0%**

Table 6. Total Number of Results by CSF Categories and Subcategories

Category	Total	Total %
Workforce	**205**	**32.1%**
Training (WT)	82	12.9%
Organization (WO)	85	13.3%
Experience (WE)	14	2.2%
Promotion (WP)	22	3.5%
Mentoring (WM)	2	0.3%
Processes	**111**	**17.4%**
Relationships	**123**	**19.3%**
Communication (RC)	50	7.8%
Teaming (RT)	49	7.7%
End-Users (RE)	24	3.8%
Resources	**86**	**13.5%**
Leadership	**35**	**5.5%**
Policies	**47**	**7.4%**
Requirements	**31**	**4.9%**
Totals	**638**	**100.0%**

D. REGRESSION AND STATISTICAL ANALYSIS

1. Regression Introduction

The goal of the regression analysis was to determine whether there is any statistically significant similarities in what participants from the different agencies believe to be the most important Critical Success Factors.

We began the analysis by generating a multiple regression model represented by the equation: $y = B_0 + B_1x_1 + B_2x_2 + B_3x_3 + \ldots + B_kx_k$ where "*y*" is the dependent variable; $x_1, x_2, x_3 \ldots x_k$ are the independent (explanatory) variables and B_0, B_1, B_2 B_3 are the coefficients (Keller, 2009). In each of the models, the outcome is measured with a dichotomous variable, in which there are only two possible outcomes. These are linear probability models and logit and probit models are often more appropriate when you have dichotomous outcomes. The dependent variable is dichotomous, meaning it only contains data coded as "1," which represents the participants providing a useable answer to the

survey question, or "0" for all other answers. The explanatory variables in the first set of analyses (Table 7) are the three Navy contracting agencies and DoD contactors. In the second set of analyses (Table 8), the explanatory variables are the different three levels of experience within NAVAIR and NAVSEA. The sample size in Tables 7 and 8 represents the number of participants who provided up to five answers from the survey. The total number of useable answers was 638.

The results displayed in each table represent statistical significance at the 1 percent, 5 percent and 10 percent levels. The significance levels are derived from the regression output and illustrate how likely the observed values were attained by coincidence. Coefficients in the tables are labeled with asterisks representing level of significance based on p-values from the regression output. P-values above 10 percent are not considered significant for this model. The standard errors are included in parenthesis under each coefficient listed in the tables. Finally, R-squared values for each regression analysis is listed to indicate the relationship between the dependent and independent variables. R-squared values can range between 0 and 1 with higher results representing a stronger relationship.

Table 7. Regression Output from Model Displaying Coefficients, Standard Errors, R-Squared Values and Sample Size for All Contracting Organizations

*NAVAIR (Reference Category)	Regression Model Results By Category						
	Workforce	Processes	Relationships	Resources	Leadership	Policy	Requirements
NAVSEA	-.095	-.107	.068	.022	.067	-.059	-.159**
(Standard Error)	(9.12)	(9.96)	(10.04)	(9.92)	(7.93)	(7.51)	(7.51)
NAVSUP-FLC	.024	-.276** *	-.228**	.175*	.079	-.051	-.073
(Standard Error)	(9.27)	(10.12)	(10.21)	(10.08)	(8.06)	(7.63)	(7.63)
Contractor A	-.454***	.127	.273**	.260 **	-.021	-.023	-.262***
(Standard Error)	(11.26)	(12.23)	(12.39)	(12.24)	(9.78)	(9.26)	(9.26)
Contractor B	-.354***	-.025	-.093	.022	-.064	-.179**	-.129
(Standard Error)	(9.92)	(10.83)	(10.92)	(10.78)	(8.62)	(8.17)	(8.17)
Sample Size	188	188	188	188	188	188	188
R-Squared	0.13	0.06	0.06	0.04	0.02	0.03	0.05
* = p < .10							
** = p < .05							
*** = p < .01							

2. Regression Models and Statistical Results for Three Navy Contracting Agencies and Two Defense Contractors

The first set of regressions we ran included each of the agencies. For this model, we chose NAVAIR as the reference category and each of the categorical dummy variables were analyzed relative to these responses. We focused on the coefficients with statistical significance at the 1 percent, 5 percent and 10 percent levels to determine any similarities between the three Navy contracting agencies and two DoD contactors. The following section will provide a breakdown of each category that contained significant results.

a. Workforce Category

The most overwhelming results came from the Workforce category. Personnel from Contractor A were 45.4 percentage points less likely to say "Workforce" relative to NAVAIR. Similarly, Contractor B participants were 35.4 percentage points less likely to say "Workforce" relative to NAVAIR.

b. Processes Category

NAVSUP-GLS was the only Navy contracting agency or DoD contractor to have a statistically significant result in this category. Participants from NAVSUP-GLS were 27.6 percentage points less likely to say "Processes" relative to NAVAIR.

c. Relationships Category

NAVSUP-GLS drastically contradicted Contractor A in this category. Contractor A employees were 27.3 percentage points more likely to say "Relationships," whereas NAVSUP-GLS participants were 22.8 percentage points less likely relative to NAVAIR

d. Resources Category

Once again, NAVSUP-GLS participants were included in this category, only this time the results showed that personnel were 17.5 percentage points more likely

to say “Resources” relative to NAVAIR. Also included in this category was Contractor A where participants were 26.0 percentage points less likely to choose “Resources” relative to NAVAIR.

e. Leadership Category

Interestingly, the Leadership category yielded no statistically significant results. As displayed in Table 7, the Navy contracting agencies and DoD contractors each generated very small coefficients.

f. Policy Category

Contractor B showed statistically significant results in two categories. The first was the Workforce category and the second was Policy where they were the only representative. Participants from Contractor B were 17.9 percentage points less likely to say “Policy” relative to NAVAIR.

g. Requirements Category

NAVSEA had one category (Requirements) that yielded statistical significance less than 5 percent, showing that personnel from this command were 15.9 percentage points less likely to say “Requirements” relative to NAVAIR. Similarly, Contractor B was 26.2 percentage points less likely to choose this category relative to NAVAIR.

3. Regression Models and Statistical Results for Three Navy Contracting Agencies and Two Defense Contractors

NAVAIR and NAVSEA were the only two agencies that provided results broken out by different levels of experience with a large enough sample size to conduct a meaningful analysis. This gave us the opportunity to test for similarities and differences between three experience levels (Junior, Midlevel and Senior) within the two agencies. Before running the model, we first had to select a reference category. For this model, we chose “Junior” as the reference category and each of the categorical dummy variables were analyzed relative to these responses. Table 8 displays the results from this set of regressions.

Table 8. Regression Output from Model Displaying Coefficients, Standard Errors, R-Squared Values and Sample Size for NAVAIR and NAVSEA

*JUNIOR (Reference Category)	Regression Model Results By Category						
	Workforce	Processes	Relationships	Resources	Leadership	Policy	Requirements
Midlevel	.125	-.127	.115	.054	.123	-.068	-.124
(Standard Error)	(12.57)	(14.34)	(14.47)	(13.75)	(11.37)	(11.50)	(11.50)
Senior	.157	.095	.015	.043	.166*	0.007	-.093
(Standard Error)	(11.03)	(12.59)	(12.70)	(12.06)	(0.10)	(10.10)	(10.10)
NAVAIR	-.051	.119	-.092	-.037	.111	.071	.195**
(Standard Error)	(9.54)	(10.89)	(10.98)	(10.43)	(8.63)	(8.73)	(8.73)
Sample Size	100	100	100	100	100	100	100
R-Squared	0.032	0.045	0.013	0.002	0.035	0.012	0.051
* = p < .10							
** = p < .05							
*** = p < .01							

The results from Table 8 did not produce as much statistically significant data as displayed in Table 7. Only one result amongst the different experience levels produced a result that was less than the 10 percent significance indicator threshold. Regression output showed that "Senior" participants were 16.6 percentage points more likely to say "Leadership" relative to the "Junior" reference category. The rest of the values produced from the model yielded high p-values and low R-squared values and therefore were not determined to be statistically significant.

E. CORRELATING METHODS AND RESULTS TO PREVIOUS STUDIES

The literature review in Chapter II includes Rockhart's (1979) description of identifying CSFs and creating a common point of reference that would in turn enable an organization to measure the success of a particular project. In order to identify CSFs within an organization, there must be a means to gather the information and subsequently analyze the data. Shah and Siddiqui (2002), Amberg, M. and Weiner, M. (2005) argue that the use of a questionnaire is the most effective method of obtaining this information.

As displayed in this chapter, we used data that Rendon received from various DoD agencies and contractors to analyze similarities or a common point of reference amongst the organizations (Rendon 2009). As illustrated in this chapter, we were able to identify statistically significant similarities and differences between each of the agencies.

This data can be used to further the limited research previously conducted in the field of contracting by testing for correlation between contracting agencies with similar CSF responses and the success, or failure, of the corresponding agencies. Depending on the results, this could potentially make way a more streamlined approach within DoD contracting by helping organizations successfully implement vision, objectives and projects (Rockhart, 1979).

F. SUMMARY

The chapter began with an outline of the structure used for the analysis, describing the categories and subcategories with various tables. Lastly, chapter concluded by displaying results from both descriptive statistics and regression analysis, illustrating each of the participants' answers to survey questions through a variety of charts, graphs and tables. The data was used to determine any statistically significant similarities and differences between the agencies and individual participants.

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VI. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

A. INTRODUCTION

This chapter will provide a summary of the research that includes answers to the questions provided in Chapter I, conclusions and insight gained from the statistical analysis and close with a discussion of recommendations for further research.

The goal of this project was to gain insight on Critical Success Factors by conducting a statistical analysis of survey responses attained from both military and civilian acquisition communities.

B. SUMMARY OF THE RESEARCH CONDUCTED

Chapter I provided an introduction that included the background, purpose of the study, problem statement, research questions, assumptions and limitations, methodology, significance of the study, and lastly the organization of the research paper. This chapter set the stage for the research.

Chapter II presented a relevant literature review on the concept of Critical Success Factors and how they pertain to the Navy contracting process. Though the idea of CSFs has been around for many years, a comprehensive study had not been present until the 1980s. Originally, the concept of indentifying a Critical Success Factors was focused on IS, but as can be seen by numerous studies there is an application to all forms of Program Management, which can be easily translated for implementation with the Department of Defense acquisition framework.

Chapter III began with a brief overview of Navy Contracting and provided a background of each organization used throughout the research. The chapter provided an overview of each of the participating Navy contracting agencies and illustrated how each agency is aligned within the Navy. The chapter concluded with a brief overview of DoD contractors.

Chapter IV began with a discussion of the rational for selecting each of the agencies included in the report. The chapter provided an overview of how the participants were selected, including selection criteria, methodology and qualification level each participant must have achieved. The chapter concluded with a breakdown of how the responses were categorized.

Chapter V began with an outline of the structure used for the analysis, describing the categories and subcategories with various tables. The chapter concluded by displaying results from both descriptive statistics and regression analysis, illustrating each of the participants' answers to survey questions through a variety of charts, graphs and tables. The data generated was used to determine any statistically significant similarities and differences between the agencies and individual participants.

Chapter VI concludes the project with a summary, conclusions, answers to research questions and recommendations for follow-on study.

C. CONCLUSIONS AND ANSWERS TO RESEARCH QUESTIONS

The chapters included in this project have identified the reasoning for conducting this research, a background of previous studies using Critical Success Factors, provided answers to research questions and a statistical analysis of the survey responses.

1. What Critical Success Factors, analyzed statistically from surveys received, can be identified from within each of the major Navy contracting activities?

As discussed previously, the seven categories and numerous sub categories made for some widely varied results. From the descriptive statistical analysis, 205 participants (32.1 percent) selected Workforce as a Critical Success Factor. This category contained the most sub-categories, which likely attributed to the high number of responses. Unlike Workforce, the Process category did not contain any subcategories and received 111 selections (17.4 percent), more than any subcategory. This was from the overall surveys as gathered from all respondents. The results for NAVSUP-GLS listed Process, Relationships and Resources being the most significant. NAVSEA listed Requirements as

the only item that was significant. Additionally, NAVAIR had very similar results. Resources could be different for each, hence, that showing up for that agency, whereas the others have different missions and funding streams. A report published by the GAO (Table 9) lists various Critical Success Factors provided by major United States government organizations. Interestingly, though some of the terminology is different, many of the categories are remarkably similar. This is an indication that many different organizations, doing different functions, believe that there are certain attributes that will ensure organizational success. Given the difference of scope of work in which NAVSUP-GLS, NAVAIR, and NAVSEA engage, it would be logical to assume that some contracting officer would feel different from another in what is the most important factor for their respective jobs. Just as the results for the various governmental organizations cited in GAO-12-7 varied widely (GAO, 2011). Rendon (2009; 2010) also identified five contract management organizational best practices categories: process strength, successful results, management support, process integration, and process measurement. Rendon uses different phrasing, but still centers around creating an environment for success. The way these results could be of benefit to the Navy is training to consistency across all Navy contracting commands and providing level loading of the requirements and funding. Another way to provide continuity for Critical Success Factors is combining the various Navy contracting agencies. All these Critical Success Factors could also be potentially correlated to Rendon's Contract Management Maturity Model (Rendon, 2010) to see if organizations that perceive strong Critical Success Factors, are a more robust organization in the contract process.

Table 9. Common Critical Success Factors for Government Organizations

1	Program officials were actively engaged with stakeholders.
2	Program staff had the necessary knowledge and skills.
3	Senior department and agency executives supported the programs.
4	End users and stakeholders were involved in the development of requirements.
5	End users participated in testing of system functionality prior to formal end user acceptance testing.
6	Government and contractor staff was consistent and stable.
7	Program staff prioritized requirements.
8	Program officials maintained regular communication with the prime contractor.
9	Programs received sufficient funding.

2. From a contracting perspective, what are the significant comparisons between the Navy contracting agencies that can be inferred from the statistical analysis?

The mission areas that these agencies engage in are all different. NAVSEA and NAVAIR engage in shipbuilding/maintaining, and airplanes. These high value high impact activities will get much visibility. NAVSUP-GLS contracting deals with items that for the most part low impact in the eyes of the DoD. This is borne out in the regression results as Process, Relationships and Resources were identified the most important Critical Successful Factors. NAVSUP-GLS gets much more reactionary requirements than NAVSEA, or NAVAIR, hence the concern for process. Additionally because they are normally first line for the consumer, it could be inferred that the relationships with the customers, suppliers, and leadership would be very important to facilitate a more streamlined contracting and acquisition process. Resources would be an issue for NAVSUP-GLS because the mission areas and funding of NAVSEA and NAVAIR is large relative as compared NAVSUP-GLS.

3. Are there any significant CSF similarities between the military contracting activities and two DoD contractors' statistical results?

Because the surveys from the DoD contractors were anonymous and we were not allowed to know what part of the defense industry they work in it makes it difficult to give fidelity to some of the vast differences this can be particularly noted in Workforce as well as some other areas. The model showed that Contractor A was 45.4 percent and Contractor B was 35.4 percent less likely to include Workforce as a Critical Success Factor. The two areas that the most similarities were Resource and Policy for the survey: All respondents were more like to view Resources as important. All respondents view Policy as being less important. This did not come as a surprise as more resources could potentially make ones job easier and similarly removing some administrative burden should make the job easier to do.

D. RECOMMENDATIONS FOR FURTHER STUDY

The statistical analysis conducted provided an insightful look into what employees from both DoD contracting agencies and DoD contractors believe to be the top five Critical Success Factors most important to an organizations success. Follow-on research could be conducted using the same format but rather than use an open-ended survey, use a standardized answer bank and compare the results to those in this report. This format could be used to conduct a similar analysis throughout a wide spectrum of various DoD contracting agencies.

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